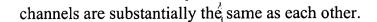
5

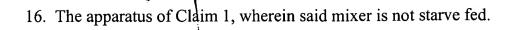


What Is Claimed Is:

- 1. An extruder mixer for plastified material comprising a rotatable elongated screw and means for rotating said screw, said screw having a mixing section adapted to mix plastified materials, said mixing section having an inlet channel connected to a cross-axial pump constructed and arranged to feed a subsequent said channel, wherein said subsequent channel is connected to further feed said mixture to at least one subsequent cross-axial pump that is bounded by a flight on at least one side of said output channel to deliver the resulting plastic mixture.
- 2. The apparatus of Claim 1, wherein the cross-axial pumps are bounded by channels on more than one side.
- 3. The apparatus of Claim 1, wherein an upstream feeder is connected to cause and to control input feed of mixable materials.
- 4. The apparatus of Claim 1, where a screw channel is provided at the input of said mixer to control the flow rate mixer input.
- 5. The apparatus of Claim 1, where an output flight is connected to a downstream flight of said mixer section.
- 6. The apparatus of Claim 1, where an output flight is connected to a channel of said extruder mixing section.
 - 7. The apparatus of Claim 1, wherein the dimensions of said first and subsequent



- 8. The apparatus of Claim 1, wherein said extruder screw is substantially vertically oriented.
- 9. The apparatus of Claim 1, wherein the dimensions of said first and subsequent channels are different from each other.
- 10. The apparatus of Claim 1, wherein the dimensions of said first and subsequent cross-axial pumps are the same.
- 11. The apparatus of Claim 1, wherein the dimensions of said first and subsequent cross-axial pumps are different from each other.
- 12. The apparatus of Claim 1, wherein said channels are oriented substantially parallel to the screw axis.
- 13. The apparatus of Claim 1, wherein said channels are oriented at an angle to the screw axis.
- 14. The apparatus of Claim 1, wherein at least some of the channels are unconnected to said inlet channel and are bounded by a flight on one side.
- 15. The apparatus of Claim 14, wherein at least some of said non-inlet channels are bounded by a flight on two sides.



17. The apparatus of Claim 1, where resistance devices are provided on said screw to force said plastic material into said outlet channels.

400

- 18. The apparatus of Claim 1, wherein there are multiple inlet channels.
- 19. The apparatus of Claim 1, wherein there are multiple connected inlet flights.
- 20. The apparatus of Claim 1, wherein there are multiple connected outlet flights.
- 2/1. In a method of mixing plastic or plastifiable materials in an extruder comprising a rotatable extruder screw having a mixing section comprising a plurality of inlet and outlet channels for said materials, the steps which comprise:
 - (a) drawing said materials into an inlet channel,
- (b) cross-axially pumping said material from said inlet channel to at least one subsequent said inlet channel, and
 - (c) cross-axially pumping said material.
- 22. The method of Claim 21, comprising the further step of cross-axially pumping said material into an outlet channel.
- 23. The method of Claim 21 comprising the further step of controlling upstream feed of input of said material to said extruder.

- 24. The method of Claim 23, wherein said input is fed through a screw channel, and wherein said step of controlling comprises constraining the feed rate of said screw channel.
- 25. The method of Claim 21 comprising the further step of controlling the rate of material output from said outlet channel.
- 26. The method of Claim 23, wherein an output flight is connected to a channel of said extruder, and wherein said step of controlling comprises limiting the rate of rotation of said output flight.
 - 27. The method of Claim 21, comprising the step of starve feeding said extruder.
- 28. The method of Claim 21 comprising the step of applying resistance to output material flow to force said plastic material into said outlet channel.
- 29. The method of Claim 21 comprising the step of introducing said plastifiable material separately into a plurality of separate inlet channels.
- 30. The method of Claim 21 comprising the step of concurrently feeding said plastifiable material into a multiplicity of individual channels.
- 31. The method of Claim 21 including the further step of connecting a plurality of said channels together for concurrent flow of said material therein.
 - 32. The method of Claim 21 comprising the step of removing said mixed material

concurrently through a plurality of multiple outlet flights.

33. The method of Claim 21 comprising the further step of maintaining said plastifiable material in a melted state within said mixing section.